MANAGEMENT OF PHARYNGOCUTANEOUS FISTULA
Pharyngocutaneous fistula (PCF) is the communication of the digestive tract with the cervical skin which originates the appearance of saliva on the skin surface after swallowing.

- At the level of the surgical incision
- Around the tracheostoma

The continuous flow of saliva is the main factor involved in hindering the closure of PCF.
CONSEQUENCES:

- Postoperative hospital stay
- Late onset of swallowing
- Reintervention
- Death caused by carotid artery rupture
Classification based on SIZE of PCF

- Type I → <2cm
- Type II → 2-4 cm
- Type III → 4-6 cm
- Type IV → > 6cm
• **Guthrie classification (1974)**

- PCF with a horizontal diameter < 8 mm
- PCF with a diameter less than ¼ of pharyngeal circumference
- PCF less than the half of pharyngeal circumference
- PCF more than the half of pharyngeal circumference
CLASSIFICATION

- **Vilar Sancho classification**
  - PCF in not-irradiated patients
  - PCF in irradiated patients
    - a) Caused by dehiscence
    - c) Caused by loss of substance
**Funk’s classification:**

1. **Pharyngocutaneous fistula**
   a) With RT, carotid artery involvement, or microvascular anastomosis
   b) Without RT, carotid artery affectation or microvascular anastomosis

2. **Pharyngostoma** (direct opening of the pharynx to the skin, often accompanied by skin loss)
EPIDEMIOLOGY

- Incidence 5 – 65%
- M>F
- 50-70 years
- 7 -10 days after surgery
- Late onset: 153 days after the procedure

<table>
<thead>
<tr>
<th>Years</th>
<th>Women</th>
<th>Women %</th>
<th>Men</th>
<th>Men %</th>
<th>Total</th>
<th>Total %</th>
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<td>&lt; 40</td>
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<td>0.7</td>
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<td>1.3</td>
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<td>4-50</td>
<td>2</td>
<td>1.3%</td>
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<td>23</td>
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<td>51-60</td>
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<td>66</td>
<td>41.7</td>
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<td>61-70</td>
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<td>47</td>
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<td>&gt;70</td>
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<td>-</td>
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<td>10.2</td>
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<td>Total</td>
<td>10</td>
<td>6.4</td>
<td>148</td>
<td>93.6</td>
<td>158</td>
<td>100</td>
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</table>
RISK FACTORS

- **Gastroesophageal reflux disease (GERD)**
  - 71% of patients with laryngeal carcinoma have abnormal 24-hour pH studies
  - Prophylactic use of Ranitidine (H2 receptor blocker) and Metoclopramide (prokinetic) have decreased the incidence of PCF and the mean length of hospital stay after total laryngectomy.

- **Malnutrition**
  - 30-50% of incidence in patients with H&N cancers.
  - The patients with >10% of weight loss in the 6 months prior to surgery were at greatest risk (50%) for development of major postop complications.

- **Age**

- **Vascular diseases** related to smoking and alcohol drinking
## RISK FACTORS

- Low preoperative Hemoglobin
- Diabetes
- Hepatopathy
- Chronic obstructive pulmonary
- Hypothyroidism
- Immunosuppressive therapy
- Preoperative radiation
- Chemotherapy

### Tabla 1. Revisión en la literatura de la incidencia de fistulas faringecutáneas tras laringectomía.

<table>
<thead>
<tr>
<th>Estudio</th>
<th>Año</th>
<th>N</th>
<th>Fistulas (%)</th>
<th>Fistula en pacientes no irradiados n/n (%)</th>
<th>Fistula en pacientes irradiados n/n (%)</th>
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<tbody>
<tr>
<td>Aprigliano et al.</td>
<td>1990</td>
<td>625</td>
<td>9</td>
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<tr>
<td>McCombe and Jones et al.</td>
<td>1993</td>
<td>357</td>
<td>23</td>
<td>12/167 (4)</td>
<td>74/190 (39)</td>
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<td>Hier et al.</td>
<td>1993</td>
<td>126</td>
<td>21</td>
<td>15/80 (19)</td>
<td>9/46 (20)</td>
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<tr>
<td>Moses et al.</td>
<td>1993</td>
<td>132</td>
<td>21</td>
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<tr>
<td>Natsu et al.</td>
<td>1993</td>
<td>197</td>
<td>14</td>
<td>2/56 (4)</td>
<td>26/141 (18.5)</td>
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<td>Papageorgiou et al.</td>
<td>1994</td>
<td>310</td>
<td>9</td>
<td>10/135 (7.4)</td>
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<td>Fradis et al.</td>
<td>1995</td>
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<td>Reyol et al.</td>
<td>1995</td>
<td>110</td>
<td>21</td>
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<td>Celikkarnat et al.</td>
<td>1996</td>
<td>110</td>
<td>17.3</td>
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<td>Tomlinson et al.</td>
<td>1996</td>
<td>50</td>
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<td>Soylu et al.</td>
<td>1998</td>
<td>295</td>
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<td>Park et al.</td>
<td>1998</td>
<td>125</td>
<td>22</td>
<td>5/22 (23)</td>
<td>23/102 (23)</td>
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<td>Radaniti da Zinni et al.</td>
<td>1999</td>
<td>246</td>
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<td>Cavalet et al.</td>
<td>2000</td>
<td>293</td>
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<tr>
<td>Herranz et al.</td>
<td>2000</td>
<td>471</td>
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<tr>
<td>Ikiz et al.</td>
<td>2000</td>
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<td>Virtomoneti et al.</td>
<td>2001</td>
<td>133</td>
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<td>Saydam et al.</td>
<td>2002</td>
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<td>Vadzia et al.</td>
<td>2006</td>
<td>122</td>
<td>20</td>
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</tbody>
</table>

N = Número de pacientes estudiados; n = número de pacientes con fistula.
RISK FACTORS

- Positive surgical margins
- Preoperative tracheostomy in emergency situations
- Tumor stage and laryngeal site
  - Supraglottic tumors have significantly more fistulas than glottic tumors. Extension to the vallecula or the piriform fossa → biggest excision of pharyngeal mucosa → more tension.
- Onset of oral feeding
- Vomit
- Infection
- Cervical dissection
RISK FACTORS

- **Suture material**
  - Vicryl 3/0 > catgut
  Vycril has greater tensile strength, less inflammatory reaction and a longer half-life.

- **Suture technique**
  - Interrupted suture
  - Extramucose suture
  - Knots tied on the inside
  - T pharyngeal closure > vertical closure
SYMPTOMS AND SIGNS

- Fever (first 48 hours after surgery)
- Persistent elevated neck drain output
- Wound erythema and edema
- Localized tenderness in central neck near the wound
- Appearance of saliva at wound after swallowing

The diagnosis is based on clinical features
DETECTION OF PCF

Can be accomplished by careful post-operative monitoring of:

- Temperature > 38.6°C the first 48h. PCF developed in 71% of the patients with early postop fever compared with 4% of those without fever.

- Wound amylase concentration > 4000 IU/λ 1th day after surgery → predictor of PCF development.

- Methylene blue swallowing test

- Radiologic assessment → Esophagogram

- Anatomopathologic examination
MANAGEMENT OF PCF

AIMS
- Prevention
- Early detection of PCF

Conservative treatment  ↔  Surgical treatment

It is a complex, dynamic and systemic process, depending on the general health condition of the patient, and can be delayed by several intrinsic factors which should be identified in order to promote the continuity of the treatment process.
Prevention

- **Surgical technique**: hemostasis and manipulation. To avoid significant crush injury to the tissues, to excise questionably viable mucosa, and to avoid unnecessary tension on the pharyngeal closure.

- **Antibiotics**: 50% of reduction of PCF incidence

- **Gastroesophageal reflux disease (GERD)**
  (ranitidine and metoclopramide 7 days)

- **Identification and management of comorbidities**

- **Enteral nutrition**: NGT or PEG for 10 days
MANAGEMENT OF PCF

- Conservative management 6-8 weeks
  - Successful rate: 60-80%
    - Irradiated patient: 35-50%

- Drainage of secretions → infection control and prevention of a large fistula
- Removal and curettage of necrotic tissue
Conservative management 6-8 weeks

- Pressure dressing for flap down
- Tube feeding with adequate nutrition
- Systemic antibiotics: broad-spectrum coverage aerobic and anaerobic
MANAGEMENT OF PCF

Conservative management 6-8 weeks

- Injection of Botulinum Toxin into the salivary glands
- Montgomery salivary bypass tube
- Hyperbaric chamber
Surgical management

- 25% of non-irradiated patients
- 60% of irradiated patients

SURGERY
MANAGEMENT OF PCF

- **Surgical management**
  - **Primary closure**: with small fistula, minimal surrounding soft tissue loss and healthy mucosa.
  
- **Loco-regional flaps**
  - a) Myocutaneous flaps
    - *pectoralis major*, *latissimus dorsi*, deltopectoral flaps
  - b) Muscle flaps
    - sternocleidomastoid flap

- **Free flaps**
  - Anterolateral thigh flap, radial forearm flap, free jejunal autograft
MANAGEMENT OF PCF

- Surgical management
  - Locoregional flaps: myocutaneous flaps
  - Pectoralis major flap
    - Rich vascularity
    - Large skin territory
    - Well vascularized tissue coverage of the carotid artery in the event of PCF
    - Easy to harvest in the supine position
    - Ability to transfer 2 epithelial surfaces for inner and outer lining
MANAGEMENT OF PCF

- Surgical management
  - Pectoralis major flap
    - Total flap necrosis 1-3%
    - Partial flap necrosis 4-7%
Management of PCF

- Surgical management
  - Pectoralis major flap
CONCLUSIONS

- Risk pre-surgery
- Identification and treatment of comorbidities
- Good surgical technique
- Multidisciplinary approach
- Post-operative hospital stay
- Possible lethal complications
THANK YOU 😊